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Determination of Science Teacher Candidates' Views on Electronic waste Pollution

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Abstract

The purpose of this study, determination of the science teacher candidates' views on electronic waste pollution. Science teachers' views on the data of electronic waste pollution. The participants of the study were determined with a purposive sample which enables researcher to choose the ones who are believed to find to solutions to the problems of the researcher. Total 75 teacher candidates that first, second and third grade from uludag university and different universities are participated to study during the 2013-2014 academic year, summer school courses. Data were collected open-ended questions which developed by the researchers. Students were answered the related seven open ended questions in almost 30 minutes. The qualitative data obtained from the study were analyzed using a phenomenological method. According to results of the study it was determined that teachers candidates are not sufficiently knowledgeable about the electronic waste and damages to the environment and human health. It was recommended that teachers candidates need to be aware of this issue.

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Keywords: Electronic waste, science education, teacher candidates, environmental pollution.

1. Introduction

Together with the fast development of technology and constant renewal of electronic devices, people's consumption habits change rapidly, and parallel to this, new types of waste emerge. New products continuously marketed more rapidly, efficiently, elegantly, and economically are making electronic devices which we are using

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"out of function" in a short period of time. In this case, electronic devices which we buy by paying a lot of money go to junk dealers or waste. Thus, the type of waste called e-waste emerges in this way (Korkut, 2009). If electronic wastes containing harmful substances such as PVC, chlorofluorocarbon, lead, mercury, cadmium, barium, beryllium, arsenic, Freon, phosphorus, etc. are not collected and recycled properly, they pose a serious threat both to the environment and living creatures. Toxic substances in electronic devices mixing with domestic or industrial wastes mix into air, soil and water. According to studies, e-wastes constitute 1% of solid wastes in the world. Every year, 20-50 million tons of e-wastes occur in the world and 300 thousand tons in Turkey and this increases by 10% every year. In our country, the annual e-waste is about 4 kilograms per person (Burke, 2007).

30% of the e-wastes are composed of washing machines, vacuum cleaners, ovens, air conditioners, coffee/tea machines, etc. 20% of these wastes come from refrigerators, 15% from DVD/VCR, CD players, radios and Hi-Fi devices, 15% from computers, phones, fax machines and printers, 10% from TVs, and 10% from monitors (Review of Directive, 2008). If it is necessary to exemplify the extent of danger, the CFC gas in refrigerators increases the greenhouse effect by keeping 10-15 thousand times as much heat as the exhaust gas. The cathode ray tube (CRT) televisions contain 2-4 kilograms of lead. 10 grams of lead contaminate 25.000 tons of soil or 200 thousand liters of water. Another example is that mercury in fluorescent makes 30.000 liters of water unusable. One seventieth of a teaspoonful of mercury can contaminate the water in a lake of 80.000 square meters. The carcinogenic phosphorous found in monitors known as CRT and in fluorescent lamps can cover a distance of 320 kilometers in the air.

It is believed that this study aiming to determine the views of science education teacher candidates about electronic waste pollution will contribute greatly to the awareness in this area.

2. Purpose

In this study, it was aimed to determine the views of science education teacher candidates about electronic waste pollution. For this purpose, answers were sought to the following questions:

1. Have you ever heard of the notion of electronic waste before? What do you know about this notion?
2. In your opinion, what can be the sources of electronic waste?
3. In your opinion, what kind of damages does electronic waste pollution give to human health and environment?
4. How do you evaluate your electronic devices losing their functions?
5. What do you think about the results of electronic waste pollution in the coming 50 years?
6. What substances are electronic wastes likely to include?
7. What do you think about the reasons why electronic wastes occur?

3. Method

3.1. Research Model

In this research, to seek answers to the research questions, the Phenomenological method, one of the qualitative research methods, was used. The Phenomenological method has become a quite-accepted method used in educational surveys to reveal what different individuals understand from or how they perceive the same notion (Wihlborg, 2004). In this method, it is generally aimed to define and interpret individual perceptions or viewpoints about a certain fact (Yıldırım & Şimşek, 2008). Even though humans live in the same world and environment, they may interpret the same facts and events in different ways (Çepni, 2007).

3.2. Research Sample

1. In this research, in the selection of the participants was used the purposeful sampling, which gives researchers the opportunity to choose people thanks to whom they can find answers to their research questions (Cohen, Manion & Morrison 2007).

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